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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/516,305

12/10/2004

Vincenzo Varriale

VARR300/JEK

8641

23364

7590

07/18/2006

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EXAMINER

SPAHN, GAY

ART UNIT

PAPER NUMBER

3673

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/516,305		VARRIALE, VINCENZO	
	<b>Examiner</b>		<b>Art Unit</b>	
	Gay Ann Spahn		3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004 and 01 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 31-63 is/are pending in the application.
- 4a) Of the above claim(s) 39-42 and 53-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-38, 43-52 and 58-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                                   |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                              | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07 July 2005</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of Species I (i.e., Fig 1a) of the first group of species (i.e., species of seal faces), Subspecies I (i.e., Fig. 3) of the first group of subspecies (i.e., species of cylindrical seal), Species I (i.e., pot die forming) of the second group of species (i.e., species of deformation step of obtaining corrugated profile), Species I (i.e., mechanical deformation) of the third group of species (i.e., species of step of obtaining channels), and Species IV (i.e., rectangular) of the fourth group of species (i.e., species of channel cross-sectional shape) in the reply filed on 01 May 2006 is acknowledged.

Applicant has listed claims 31-38, 42-46, 48-52, and 58-63 (including generic claims) as being readable upon the elected species. However, although claim 42 may pertain to elected subject matter, it is dependent upon claim 39 which is being withdrawn as non-elected subject matter so that claim 42 is being withdrawn as well.

In addition, although claim 47 was not listed as being generic or readable upon the elected species, the examiner believes that claim 47 is generic and will be examined.

Claims 39-42 and 53-57 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 01 May 2006.

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement (i.e., the examiner notes that EP 945,658 on the last line of page 1 and JP 59-232627 on lines 11-12 of page 2 have been listed on an Information Disclosure statement, but that U.S. Patent No. 2,691,773 on lines 21-22 of page 1 has not been listed on an Information Disclosure Statement). 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The information disclosure statement (IDS) submitted on 07 July 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

### ***Drawings***

The drawings are objected to because:

- (1) Fig. 4, the cross-section of the metal sheets should have thin-lined diagonal cross-hatching to indicate the material metal; and
- (2) Fig. 6 is incorrect in that it must be divided into two figures, the structure on the left-hand side being one figure and the detailed view of the multiple plies of the cylindrical body on the right-hand side being another, separate figure.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

The specification appears to be a direct translation from a foreign language and has not been checked to the extent necessary to determine the presence of all possible minor errors.

Two examples of minor errors are, as follows:

- (1) page 4, line 12, the word "pressurisation" should be changed to the U.S. spelling of --pressurization--; and
- (2) page 5, line 16, "being the channels shallow" should be changed to --the channels being shallow--.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 31-38, 43-52, and 58-63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

**Claim 31**, line 6, (and claims 32-38 and 43-45 either directly or indirectly dependent thereon), the recitation of "the volume" is vague, indefinite, and confusing as lacking antecedent basis because no volume has been previously introduced in the claim. The examiner suggests amending lines 4 and 5 to read --placing at least a first

and a second of said sheets into close mutual contact so that said at least one face with said channel in said first sheet faces said second sheet to define a volume--.

**Claim 31**, lines 4-8, the recitation of the steps of “placing at least a first and a second of said sheets into close mutual contact so that said at least one face with said channel in said first sheet faces said second sheet” and “sealing the edges of said first and second sheets so that the volume confined between said first and second sheets is hermetically isolated from the outside environment” are vague, indefinite, and confusing as being inaccurate since these steps are not really being performed on planar sheets, but instead are only performed after the planar sheets have been formed into the “hollow cylindrical bodies” which appears to be an essential step since it is the cylindrical seal that has been elected (i.e., the rectangular planar sheet of Fig. 1a to make the cylindrical seal of Figs. 3 or 6) and not the planar seal of Fig. 10 (i.e., disc-shaped blank of Fig. 9 not elected).

**Claim 33**, lines 1-2, the recitation that “a plurality of channels, arranged . . . in serpentine” is inaccurate because there is only a single channel in Fig. 1b, not a plurality of channels.

**Claim 35**, lines 3-4, the recitation of “the obtained cylinders” is vague, indefinite, and confusing as lacking antecedent basis because it is not understood if the cylinders are referring back to the hollow cylindrical bodies or not.

**Claim 37**, lines 1-2, the recitation of “said cylinders” is vague, indefinite, and confusing as lacking antecedent basis because it is not understood if the cylinders are referring back to the hollow cylindrical bodies or not.

**Claim 45**, line 2, the recitation of “a pressure above/below the external pressure by means of a compression/suction device” is vague, indefinite, and confusing and the examiner suggests amending --a pressure above or below the external pressure via a compression device or a suction device, respectively--.

**Claim 46**, lines 1-5, the recitation of “[a] multilayer seal comprising at least a first and a second superimposed layers, in close mutual contact and sealed along the edges so as to define between said layers a corresponding volume, which is hermetically isolated from the surrounding environment and in which the pressure is set to a preset value, characterized in that at least one face of said layers facing said volume is provided with at least one channel” is vague, indefinite, and confusing as not accurately defining the seal per se as it is in final form.

According to the specification (page 5, lines 4-7), the volume in the final seal structure is supposed to be only the space created by the interior face of the metal cylindrical body (1 in Fig. 4) and the outer perimeter of the channels (3) in the exterior face of the metal cylindrical body (1' in Fig. 4) when the two metal cylindrical bodies (1, 1') are immediately adjacent or touching one another. Thus, it appears that the claim language is inaccurate in that it is describing Fig. 4 in that the volume defined in the claim is the gap between the interior and exterior surfaces of the metal cylindrical bodies (1, 1') when they are close to each other, but not touching and the volume of the channels (3) simply faces that volume between the two cylindrical bodies.



Further, if by "close mutual contact" the Applicants mean that the interior and exterior surfaces of the metal cylindrical bodies (1, 1'), respectively, are touching, then no there is no volume at all between the layers.

Applicants must amend the claims to the article of manufacture (i.e., the seal as it exists as a final product, not as it is being manufactured).

**Claim 47**, lines 1-2, the recitation that "said seal comprises a pressure detector connected with said volume" is vague, indefinite, and confusing because it is not understood how a seal per se could comprise a pressure detector. Is Applicant claiming the seal in combination with a pressure detector?

**Claim 48**, lines 1-3, the recitation of "a plurality of channels" is vague, indefinite, and confusing as lacking antecedent basis because it is not understood if there are a plurality (i.e., at least two) of channels in addition to the at least one channel already recited in claim 46 or if the plurality of channels includes the at least one channel already recited in claim 46.

In addition, the recitation that "a plurality of channels, arranged . . . in serpentine" is inaccurate because there is only a single channel in Fig. 1b, not a plurality of channels.

Also, "are obtained" is method claim language and should be changed to recite that the channels are in the exterior face of one of the layers.

**Claim 50**, lines 1-3, the recitation that "said hollow cylindrical bodies are sealed along their edges by welding through the interposition of a corresponding first and second insert" is vague, indefinite, and confusing since it is not understood what is

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meant by "through the interposition of a corresponding first and second insert". If Applicant is trying to say that the edges of the hollow cylindrical bodies are welded to the first and second insert, then such should be said more clearly.

**Claim 51**, lines 1-2, the recitation of "said inner cylinder and said outer cylinder" is vague, indefinite, and confusing as lacking antecedent basis since it is not clear if this is referring back to the hollow cylindrical bodies or not.

**Claim 52**, lines 1-2, the recitation of "said inner cylinder and said outer cylinder" is vague, indefinite, and confusing as lacking antecedent basis since it is not clear if this is referring back to the hollow cylindrical bodies or not.

**Claim 58**, lines 1-2, the recitation that "said ring has, on its inner wall, an annular groove" is vague, indefinite, and confusing because the groove is presumably recessed into the inner wall of the ring, not "on" the inner wall. In addition, the word "its" should be changed to --the-- for proper antecedent basis.

**Claim 59**, line 2, the recitation of "the outside" is vague, indefinite, and confusing. The outside of what?

**Claim 60**, line 2, the recitation of "through a capillary" is vague, indefinite, and confusing and the examiner suggests amending to --via a capillary--.

**Claim 61**, line 2, the recitation of "above/below" is vague, indefinite, and confusing and should be changed to --above or below--.

**Claim 62**, lines 1-2, the recitation of "at least one free layer is provided in said volume" is vague, indefinite, and confusing as it is not clear that, as stated on page 10,

lines 14-31, when there is a free layer between the inner and outer cylindrical bodies, the free layer has the channels are on the face of the free layer to create the volume.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 46-48 and 61 are rejected under 35 U.S.C. 102(b) as being anticipated by ROACH et al. (U.S. Patent No. 5,072,622).**

**As to claim 46, ROACH et al. disclose a multilayer seal (10) comprising:**

at least a first and a second superimposed layers (14, 16), in close mutual contact and sealed along the edges so as to define between said layers (14, 16) a corresponding volume (volume in grooves 54 and 60), which is hermetically isolated from the surrounding environment (by vacuum pump 46) and in which the pressure is set to a preset value (zero at vacuum), characterized in that at least one face of said layers (14, 16) facing said volume is provided with at least one channel (54 or 60).

**As to claim 47 (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. disclose the seal of claim 46 as discussed above, and ROACH et al. also disclose that said seal (10) comprises a pressure detector (leak detection system 36) connected with said volume.**

As to claim 48, ROACH et al. disclose the seal of claim 46 as discussed above, and ROACH et al. also disclose that a plurality of channels (54 or 60), arranged parallel to each other or in serpentine or in a grid or radially, are obtained on at least one face (40) of at least one of said layers (14, 16).

As to claim 61, ROACH et al. disclose the seal of claim 46 as discussed above, and ROACH et al. also disclose that said volume is brought to a pressure above/below the external pressure (zero pressure at vacuum in below external pressure).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 49 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROACH et al. (U.S. Patent No. 5,072,622) in view of OWEN (U.S. Patent No. 3,472,062).**

As to claim 49, ROACH et al. disclose the seal of claim 46 as discussed above, and ROACH et al. also disclose that at least one (14) of the two layers (14, 16) is a hollow cylindrical body of sheet metal.

However, ROACH et al. fail to explicitly disclose that both of the layers are hollow cylindrical bodies of sheet metal.

OWEN discloses a testable and pressurized multiply ply bellows having two layers which are both hollow cylindrical bodies of sheet metal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the seal of ROACH et al. by making the second layer having the channel therein be made of metal as taught by OWEN in order to provide plural layers of metal as a more sure barrier between the fluid flowing inside the pipeline and the external environment.

**As to claim 62, ROACH et al. disclose the seal of claim 46 as discussed above.**

However, ROACH et al. fail to explicitly disclose that at least one free layer is provided in said volume.

OWEN discloses a testable and pressurized multiply ply bellows having three layers (see Fig. 6), wherein the middle layer is at least one free layer provided in said volume.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the seal of ROACH et al. by including at least one free layer provided in the volume as taught by OWEN in order to provide plural layers of metal as a more sure barrier between the fluid flowing inside the pipeline and the external environment.

**Claims 50-52 and 58-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROACH et al. (U.S. Patent No. 5,072,622) in view of OWEN (U.S.**

**Patent No. 3,472,062), as applied to claim 49 above, and further in view of THOMA (European Patent Application Publication No. EP 945 658 A1).**

**As to claim 50, ROACH et al. in view of OWEN disclose the seal of claim 49 as discussed above.**

However, ROACH et al. fail to explicitly disclose that said hollow cylindrical bodies are sealed along their edges by welding through the interposition of a corresponding first and second insert.

THOMA discloses a bellow seal (10 in Fig. 1) wherein the edges are sealed by welding through the interposition of a corresponding first and second insert (6, 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multilayer seal of ROACH et al. in view of OWEN by making the hollow cylindrical bodies be sealed along their edges by welding through the interposition of a corresponding first and second insert as taught by THOMA in order to be able make the seal in a way that it can still be connected to testing equipment for monitoring leakage.

**As to claim 51, ROACH et al. in view of OWEN and THOMA disclose the seal of claim 50 as discussed above, and THOMA also disclose that said first insert (21) is a metal ring, said inner cylinder and said outer cylinder being welded to the inner wall and to the lower edge of said metal ring (see Fig. 1), respectively.**

**As to claim 52, ROACH et al. in view of OWEN and THOMA disclose the seal of claim 50 as discussed above, and THOMA also disclose that said second insert (21) is**

a metal cover, said inner cylinder and said outer cylinder being welded to the side edge of said metal cover (see Fig. 1).

**As to claim 58, ROACH et al.** in view of OWEN and THOMA disclose the seal of claim 51 as discussed above, and THOMA also discloses that said ring (21) has, on its inner wall, an annular groove (at edge of 12) communicating with said at least one channel.

**As to claim 59, ROACH et al.** in view of OWEN and THOMA disclose the seal of claim 58 as discussed above, and THOMA also discloses that said annular groove (at edge of 12) communicates with the outside through a radial bore (what 16 is in) in said ring (21).

**As to claim 60, ROACH et al.** in view of OWEN and THOMA disclose the seal of claim 59 as discussed above, and THOMA also discloses that said radial bore (what 16 is in) is connected, outside said ring (21), with a pressure detector (14) through a capillary (16).

**Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over ROACH et al. (U.S. Patent No. 5,072,622) in view of LICHTENBERGER (U.S. Patent No. 2,691,773).**

**As to claim 63, ROACH et al.** disclose the multilayer seal of claim 46 as discussed above.

However, ROACH et al. fail to explicitly disclose a valve for fluids including a multilayer seal.

LICHTENBERGER discloses a valve for fluids including a bellows seal (18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the valve for fluids of LICHTENBERGER by substituting the multilayer seal as taught by ROACH et al. for the bellows seal of LICHTENBERGER in order to improve the performance of the seal against leaking of fluids from the valve.

**Claims 31-37 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROACH et al. (U.S. Patent No. 5,072,622) in view of FORD (U.S. Patent No. 2,170,015) and TANAKA (Japanese Patent Application Publication No. JP 59-232627 A).**

**As to claim 31** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. disclose a method of producing a multilayer seal, comprising the steps of:

preparing a plurality of substantially cylindrical sheet bodies (14, 16);

obtaining at least one channel (54) on at least one face of at least one of said substantially cylindrical sheet bodies (16);

placing at least a first and a second of said cylindrical sheet bodies (14, 16) into close mutual contact so that said at least one face (40) with said channel (54) in said first cylindrical sheet body (16) faces said second cylindrical sheet body (14);

sealing the edges of said first and second cylindrical sheet bodies (14, 16) so that the volume confined between said first and second cylindrical sheet bodies (14, 16) is hermetically isolated from the outside environment (via vacuum pump 46);



bringing said hermetically isolated volume to a preset pressure value (i.e., the pressure value of zero for vacuum is a preset pressure value).

ROACH et al. fails to explicitly disclose that the steps of are being performed on first and second planar sheets ( i.e., preparing a plurality of substantially planar sheets; obtaining at least one channel on at least one face of at least one of said sheets; placing at least a first and a second of said sheets into close mutual contact so that said at least one face with said channel in said first sheet faces said second sheet; and sealing the edges of said first and second sheets so that the volume confined between said first and second sheets is hermetically isolated from the outside environment).

FORD discloses that shaping flat pieces of sheet metal (13) into hollow cylindrical bodies is well-known in the art.

TANAKA discloses that it is well-known in the art to dispose hollow cylindrical bodies of different diameters within each other in order to manufacture a multi-layer bellows.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of producing a multilayer seal of ROACH et al. by shaping flat pieces of sheet metal into hollow cylindrical bodies as taught by FORD and by disposing the thus-formed hollow cylindrical bodies within each other to form a multi-layer bellows as taught by TANAKA in order to easily manufacture the bellows seal with simply equipment rather than having to produce the hollow cylindrical bodies through an extrusion process requiring more costly equipment.

**As to claim 32** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and ROACH et al. also disclose that said volume is connected with a pressure detector (leak detection system 36 including combined monitoring and control system 42 connected to power source 44 and vacuum pump 46).

**As to claim 33** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and ROACH et al. also disclose that a plurality of channels (a plurality of parallel and evenly spaced grooves 54 connected to a plurality of helically extending grooves 60 in Fig. 2), arranged parallel to one another or in serpentine or in a grid or radially, are obtained on at least one face (40) of at least one of said sheets (16).

**As to claim 34** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and ROACH et al. in view of FORD and TANAKA also disclose that the two sheets (14, 16) forming the layers of the multilayer seal are substantially rectangular metal sheets.

**As to claim 35** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and disclose that after attainment of said channels, FORD discloses that said sheets are submitted to a

shaping step to obtain corresponding hollow cylindrical bodies, and TANAKA discloses that said sheets are superimposed by placing the obtained cylinders inside one another.

**As to claim 36** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 35 as discussed above, and FORD also disclose that said shaping step is obtained by means of a curving process followed by welding along two contiguous edges (see Figs. 3 and 4 and page 2, 1<sup>st</sup> column, lines 3-28).

The examiner notes that although FORD teaches spot welding, it is well-known in the art to weld a continuous seam along the length of the ends (14, 14) in order to provide a stronger attachment for use in harsher environments.

**As to claim 37** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 35 as discussed above, and TANAKA also disclose that after said shaping, said cylinders are submitted to a deformation step to obtain a corrugated profile.

**As to claim 43** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. disclose the method of claim 31 as discussed above.

However, ROACH et al. fail to explicitly disclose that said channels are obtained through mechanical deformation, laser technology, chemical corrosion, deposition of material or application of spacers onto the surface of said sheet.

The examiner takes Official Notice that mechanical deformation, laser technology, chemical corrosion, deposition of material, and application of spacers are all well-known ways in the art to form channels or grooves in the surface of sheet metal.

It would have been an obvious expedient to one of ordinary skill in the art at the time the invention was made to modify the method of producing a multi-layer seal of ROACH et al. in view of FORD and TANAKA by making the step of obtaining channels or grooves in the surface of sheet metal be done according to any of the well known ways of mechanical deformation, laser technology, chemical corrosion, deposition of material, and application of spacer in order to optimumly manufacture the seal in the most economical (i.e., mechanical deformation is cheap, but not necessarily most technically accurate), most technically accurate (i.e., laser cutting is probably most technically accurate, but requires expensive equipment), etc. way possible depending upon what objective is most desirable.

**As to claim 44** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and ROACH et al. also disclose that said channels have half-circular, rectangular or triangular cross-sectional shapes (see Figs. 7A-7F).

**As to claim 45** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. in view of FORD and TANAKA disclose the method of claim 31 as discussed above, and ROACH et al. also

disclose that said volume is brought to a pressure above/below the external pressure by means of a compression/suction device (vacuum pump 46).

**Claim 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROACH et al. (U.S. Patent No. 5,072,622) in view of FORD (U.S. Patent No. 2,170,015) and TANAKA (Japanese Patent Application Publication No. JP 59-232627 A), as applied to claim 35 above, and further in view of THOMA (European Patent Application Publication No. EP 945 658 A1).**

**As to claim 38** (and as best understood despite the 35 U.S.C. § 112, second paragraph, indefiniteness discussed above), ROACH et al. disclose the method of claim 35 as discussed above.

However, none of ROACH et al., FORD, and TANAKA explicitly disclose that said edges are sealed by welding through the interposition of a corresponding first and second insert.

THOMA discloses a bellow seal (10 in Fig. 1) wherein the edges are sealed by welding through the interposition of a corresponding first and second insert (6, 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of producing a multilayer seal of ROACH et al. in view of FORD and TANAKA by welding the edges to first and second inserts as taught by THOMA in order to be able make the seal in a way that it can still be connected to testing equipment for monitoring leakage.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Various patent cited of interest as showing configurations of bellows seals and leak detection include: U.S. Patent No. 3,299,417 to Sibthorpe; U.S. Patent No. 4,511,162 to Broyles; U.S. Patent Nos. 3,927,818 and 3,831,498 both to Harrington, Jr.; U.S. Patent Nos. 6,220,079, 6,634,388, and 6,935,376 to Taylor et al.; U.S. Patent No. 6,032,960 to Wendl et al.; and U.S. Patent No. 4,848,408 to Fortmann et al.

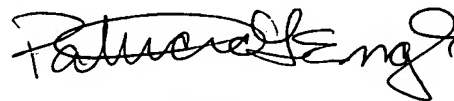
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gay Ann Spahn whose telephone number is (571)-272-7731. The examiner can normally be reached on Monday through Thursday, 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patricia L. Engle can be reached on (571)-272-6660. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

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**GAS**  
Gay Ann Spahn, Patent Examiner  
July 8, 2006



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